Owen Gingerich "Evolutionary Creationism"

Episode 22 (transcript of audio) of The Advent of Evolutionary Christianity

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Michael Dowd (host): Welcome to Episode 22 of "The Advent of Evolutionary Christianity:

Conversations at the Leading Edge of Faith." I'm <u>Michael Dowd</u>, and I'm your host for this series, which can be accessed via <u>EvolutionaryChristianity.com</u>, where you too can add your voice to the conversation.

Owen Gingerich is our featured guest today. Owen is professor emeritus of astronomy and the history of science at the Harvard Smithsonian Center for Astrophysics. He is the author of over twenty books, including God's Universe and The Eye of Heaven: Ptolemy, Copernicus, Kepler. Owen is also active in the American Scientific Affiliation, a fellowship of Evangelical scientists committed to the Bible and integrity in the practice of science. Here we discuss "Evolutionary Creationism."

Host: Hello Owen Gingerich, and welcome to this conversation on evolutionary Christianity.

Owen: Thanks Mike, I am glad to join you and it promises to be interesting.

Host: Well, they certainly have been so far. I have been rather blown away with the quality and the diversity of thought leaders involved in this conversation and how many different ways there are to be a deeply committed Christian who also fully embraces an evolutionary understanding of reality. So Owen, I'd love to have you begin as I'm asking everybody, to share a little of your testimonial—to share with our listeners the highlights of both your faith journey and also your embrace of this huge and ancient universe as revealed through science.

Owen: I grew up in a Christian home and I haven't departed from that—although, obviously, my Christianity and my understanding of scripture, of the history of the universe, and so on have deepened throughout the years. It's always amazing to me when a memory pops into my mind that I know I haven't thought about for 50 years, but there it was. One day, not so long ago, an image came in my mind: I was in the public library with my father, in the little town of Washington, lowa, where I was born. I picked a book off the shelf. It was a geology book, and it showed how lowa, Illinois, and Indiana were part of a great sea early on in the geological

history of the Earth. And my father took a look at the book and said, "Maybe you should have an astronomy book." Somehow, geology was a dangerous subject. Now, there was no strong teaching for or against evolution in our home, in our church circles. But basically it was given the silent treatment. It was seen as somehow dangerous territory.

It wasn't until much later in my life, when I was in college, that I began to see the scientific material coming from geology, as well as from astronomy, paleontology, biology, and so on. The picture began to come together. I realized that my parents were not against it; they were simply ignorant of it—for no fault of their own. My father was working on his PhD. He was a historian and not cutting himself off from these kinds of things. It's just that they weren't part of his environment or his background.

So, among other things, I would like to be writing a book on evolution for mainstream Christians who are puzzled, mystified, but open-minded about this kind of subject and curious as to what the controversy is about. Where are the tension points between this theory and Christianity? So these are the issues that I have been working out over the years. It comes slowly as one reads carefully about the scientific materials and the theological materials.

Host: You grew up Mennonite, didn't you? And didn't I remember reading that your dad taught at Bethel?

Owen: My father taught at Bethel College in Kansas. That's where we moved to from lowa. Then he moved to Goshen, Indiana, and that's where I went to college. Goshen College had as its motto, "culture for service." And it rather worried me, when it came time for me to go on to a career path, about going on in astronomy because it seemed to me that in some ways astronomy was rather useless—I mean, in the same sense that poetry is useless. But one of my teachers said, "You know, we shouldn't let the atheists take over any particular field. If you feel a calling to go into astronomy, you should give it a try." And I realized only much, much later, in fact only a few years ago, that within the conservative churches, there was an awakening right after World War II that their young people were *not* going on in advanced education in various fields. So there was no one who could speak authoritatively about these various areas.

So this resistance against higher education was melting away, and I was one of those who was part of that fallout. And so I, in fact, pursued a career in astronomy.

Host: Could you say a little bit more, Owen, about both your education and your career?

Owen: After I graduated from Goshen College with a degree in chemistry, I had the opportunity to come here to <u>Harvard</u>, to <u>Harvard Observatory</u> and graduate school. I eventually got a degree in astrophysics using the modern computing machinery, which had come in around that time. Then I had a wonderful opportunity to teach one of the introductory courses here at Harvard College for the undergraduate non-science people. I taught that course for about 35 years. Eventually, it became the longest-running course at Harvard under the same

management. So I've had a few thousand students and about a hundred teaching fellows. I sometimes felt that teaching them how to teach was as important as teaching the undergraduates themselves.

Host: Amen! In fact, you are rather legendary in some of the attention-grabbing ways of teaching that really engage people's hearts, their fascination, and that also teach lessons. I wonder if you can share just a few examples of some of the ways that you captured attention and helped students to really *get it*—in a deeper than merely didactic way.

Owen: For starters, we always figured that if you couldn't keep the students awake, they weren't going to learn anything. So we tried to have experiments and demonstrations and interesting ideas that were attractive and could actually keep them awake. We did all sorts of things—like dropping an apple from the top of the auditorium to check up on the acceleration due to gravity, or demonstrating Newton's third law (for each action there is an equal and opposite reaction) with a small cart with a fire extinguisher at the back that puffed out the carbon dioxide and propelled the cart right out of the classroom.

Host: [laughter] That's great! Connie and I both are firm believers that if education is not fun and engaging, it doesn't last in a student's mind.

Owen: There was another interesting point about teaching. I was told when I started that you can ask the students to write an essay on any possible topic—except religion. If they write a paper about a religious topic, and it's a lousy paper and you give it the grade it deserves, they will take it as a personal attack on their beliefs. I thought about that for a few years when I started teaching, but I realized that there were important religious and science issues that were bothering a lot of students. And there were probably a lot of very uninformed bull sessions in sophomore rooms. So I thought people should learn that there is, in fact, a serious literature on this subject. If they're prepared to write an essay on it and engage in some of the books, this could be okay.

So I told the students that, on the list of essay subjects, I had added a new topic that related to the historical development of science and its relation to Christianity. I said, "This could be a controversial topic, and I'll be grading those essays myself." Well, what do you know?! Nearly half the class decided to write on that. So I had a huge stack of essays to read. I read these with one of the other teaching fellows, and we independently graded them—and we didn't have any deviation more than a plus or minus sign. So I decided, okay, this *can* be objectively done, and I can trust my graduate student teaching fellows to grade them. We always put two readers on every paper, just in case there was a paper that somehow rubbed someone the wrong way. But it worked out—and I think it was helpful to students to be able to engage in a topic like that, which really interested them. Also, it was important for them to find out that they weren't the first ones to think about these topics.

Host: That's great, Owen. That touches on one of the things that I feel is most important in education—not just at the college and university level, but also even beginning in high school—which is, giving students the opportunity to take the same facts, the same evidence, the same science-based understanding, and think through some of the ways to *interpret* those facts, to interpret what science is revealing (or "what God is revealing through science," as I like to speak about it). And to do so in a way that enriches their faith, or expands their faith, or deepens their faith. As well, they should also be encouraged to read or research, Who are the other writers who have also been doing that?

What you're sharing now is very exciting to me. I think that's vital work that needs to happen. In fact, I think we do our students a disservice by *not* giving them the opportunity to see others who have done that—but also to think through for themselves: How can *they* interpret what science is uncovering and revealing in ways that are enriching or strengthening or deepening of their faith?

Owen: I always had some of my teaching fellows who were real skeptics, and they made sure that there was sort of a balanced list of reading material. So there were multiple viewpoints in the reading material, which I thought helped produce a more thoughtful result.

Host: That's great. Now, I want to ask you more about your bridge-building work. But before I do that, I've got to ask—because you're one of the great living scholars of Copernicus—if you could please share with our listeners your decades-long research into Copernicus. What have you uncovered, and what have you written about that?

Owen: After about a decade of work in astrophysics, I turned my research attention to the history of science. It was not a great career shift, in a way, because I was always interested in: What are the scientific claims for truth versus religious claims for truth? How do these two great areas work together—or against each other?

If one does some modern science, you get a good clue as to how science works. But also, if you look historically, you can often have even greater perspective. So I was interested in the great astronomical revolution when the geocentric (the Earth-centered) system was overthrown by the heliocentric system. And it surprised some commentators that when Copernicus proposed the heliocentric system, there wasn't a great a wakening. [There is no evidence that] all of a sudden people were saying, "Wow, that's it! Why didn't we think of this before?"

Rather, as I look at it, you see people looking at this novel idea that the Earth is in motion and thinking, "Wait a minute, if the Earth is spinning every twenty-four hours, why don't people fly off? And if the Earth is going around the sun every year, how in the world can it keep the moon in tow? This business is all ridiculous!"

As one person noted, "If the Earth is spinning, it's going to be a lot harder to walk west than to walk east."

So there were a lot of proof texts that were used. Perhaps the most famous one is Psalm 104: that the Lord God "laid the foundation of the Earth, that it not be moved forever." That text

was cited over and over again as meaning that the Copernican system could not be sustained by a Christian. It was Galileo who said, "The Bible teaches how to go to heaven, not how the heavens go." In other words, it's not a scientific textbook. You shouldn't be looking at it from that point of view.

Host: That's great. Please say a little bit about your book that emerged from this research.

Owen: For about thirty years, I searched for every possible copy of Copernicus's book. It was first published in 1543. A second edition came out in 1566. There are altogether something more than 600 copies surviving of these two editions put together. And I have seen about 95% of them, which means going to a lot of libraries. Now you may wonder, why in the world would I look at so many books that are just the same? Well, the reason was of course *not* to look at the printed text, which *was* just the same, but to look at what was written in the margins. How were people looking at this book? How were they accepting it? And throughout the 16th century, almost everybody who was a technical astronomer and could really appreciate the book looked at it as *the* up-to-date *recipe* book—the cookbook for calculating positions of planets. They did *not* take it as physical reality.

Host: Wow, fascinating! And the title of the book that you wrote on all your historical research on this topic is *The Book Nobody Read*. Please share what that's about.

Owen: Well, after I put out the census describing the individual copies, I wrote a memoir about *making* the census. And I titled it ironically, because the novelist Arthur Koestler had essentially said that Copernicus's book was "the book nobody read" and an all-time worst seller. Now Koestler was a very clever guy, and I had to ask myself, "Why did he get so badly misled?" And I guess it's because *he* thought that once the idea came out, everybody should see the light and adopt this. Whereas in reality, it took well over a century before the majority of astronomers were willing to take the moving Earth as objective reality.

Host: Yes, paradigms don't shift rapidly—and this is probably the first huge example of that in the Western world.

Well, Owen, you've also been involved in what I consider to be one of the most important organizations working within Evangelicalism, the <u>American Scientific Affiliation</u>, also known as the ASA. Could you share a little bit about the mission of the ASA and your participation with that body of scholars and Evangelical scientists?

Owen: I always say that it's an organization of scientists who take both science and the Bible seriously. It is a bridge-building operation between these two areas. It holds annual meetings, it has a quarterly journal, and it sponsors various symposia and sessions where people wrestle with some of these problems.

Host: Because your own work is so bridge-building, how would you describe your own understanding as distinct from "Intelligent Design"?

Owen: I suppose there are some members of the ASA who are very much interested in Intelligent Design. You have to be careful about this because it's the capturing of good words by a particular movement. I think most of us in the ASA believe in an intelligent Creator, and we would say that the universe has intelligent design in the sense that here we have a universe that is very congenial for life: It has the right elements; it has the right physical conditions here on Earth for intelligent, thoughtful life.

I like to say I believe in intelligent design with a lowercase "i" and a lowercase "d." That's something quite different from the Intelligent Design movement, which seems to me to be largely: (1) an anti-evolution movement, and (2) an attempt of some sort to prove the existence of God. I think that *that* is conceding too much to the atheists—that somehow science is all-important and the only way we interpret things. Science is very important, but it's not necessarily the *end* of it all or the entire reality.

So what I say about intelligent design and about the idea of teaching it in high school biology classes, it's something that has to do—well, let's put it this way—with Aristotelian logic: about *efficient* causes (*how* things are done) and *final* causes (*why* things are done). John Polkinghorne asks a very interesting question: "Why is the water in the teakettle boiling?" And you can say, "Well, the heat coming in from the bottom makes the molecules of water go faster and faster, and eventually some of them fly out the top, and the water boils." You can also ask why the water in the teakettle is boiling by saying, "because I want some tea." Now, *that* is a *final cause*. The motion of the molecules is the *efficient cause*—how it's done. Today, science works mostly by efficient causes. In Aristotle's day, final causes were seen as very important. I would say that "because I want some tea" is an example of a final cause.

Similarly, when we talk about Creation and how life came to be on Earth, scientifically you're looking for an efficient cause: *How* did this happen? *How* did you have natural selection, variations, mutations, all working as a kind of an engine that can bring new forms of life on board?

It may be that there is a God-given design or purpose—not necessarily an exact blueprint, but an intention. That would be what I would call a final cause. And I think it's a serious category error to say that you should be teaching intelligent design in a biology classroom as an alternative, because it doesn't answer the basic questions that biologists want to answer: Why is our DNA so much like the DNA throughout the whole rest of the kingdom of life? Or, How can you explain the particular fauna and flora that you would see in the Galapagos? Why are certain forms of life there and essentially no basic mammals?

Okay, there are lots of questions about the distribution of life forms and the distribution of life forms historically that the theory of evolution answers, and the theory of intelligent design doesn't have a clue—at least not in terms of a mechanism that can help you predict things.

Host: Right, exactly. Well, Owen, I'd love to go a little deeper into your own bridge-building of not just reconciling but really holding science (holding what the history of the universe reveals) in a way that expands and deepens your faith. I think that one of the things common to all of us in this teleseries is that we really go beyond mere reconciliation. All of us have a deep-time understanding that we gain through evidence, through science, and we hold it in ways that are a blessing to our faith. It's not just that we are not threatened by evolution or not threatened by what science is revealing, but (for I think for all of us) it actually becomes a positive thing. It can expand or deepen or (in my case) naturalize—or in some way further or enhance—our relationship to God. So I'm wondering if you could share a little bit about, What is it like for *you* to be an "evolutionary creationist" or a "theistic evolutionist" or whatever language works for you?

Owen: I am looking for a coherence in the scientific tapestry—where the multiple ways of finding out about the age of the Earth, for example, fall in line in a coherent picture. I've had a lot of very earnest Christians ask me, "Well, why does the universe have to be so old?" And I say, "Well, I believe that God, in God's might and power, could have created the universe in many ways. But it's part of our job as scientists to figure out *which* way God did it."

And if someone says, "We've got a very *young* universe and all of those fossils were just *put* there," well then, I have to say, "You know, your *memories* could have been put there yesterday; you could have been created with all your memories in place. That strikes me as a trickster God—and that's not the kind of God I want to believe in."

Okay, so why is the universe so old? Well, it's an interesting picture, but we see that life could not have formed in the very earliest days of our universe because the proper elements weren't in place. In the Big Bang you get hydrogen in great abundance, a substantial amount of helium, maybe a little bit of lithium, and just bare traces of anything else. To make life on Earth, we *have* to have carbon. We just can't figure out how to do it without an atom that can bind to itself and make the complexity that's necessary.

It helps an awful lot to have oxygen. If you don't have oxygen, you can't have H_2O —water. So, oxygen and carbon, nitrogen, phosphorous, sulfur—these essential elements for life—come much later in the picture. They are formed in hellishly hot cauldrons in the cores of stars. And it isn't a terribly efficient process, so it takes an enormous length of time for these elements to form in the nuclear reactions. Eventually, some of the more massive stars blow themselves up, and the elements get scattered back into space. And a newer generation of stars can have an abundance of iron, carbon, oxygen, and so on.

For example, our sun did not exist in the earliest stages of the universe. It's quite old—maybe five billion years old—but that's not nearly as long as the universe itself has been in existence, which is something in the order of thirteen billion years. So, strangely enough, the universe we inhabit required this *long time* for things to develop and for the elements to be born. But to me, that's an awesome picture. Don't you find that amazing, that over this period, the elements gradually emerge, and then life can form?

Host: Amen! My wife and I both do children's stories and stories for all ages in church services. Virtually every Sunday I'm speaking at some church, and sometimes Connie's at another church on the same Sunday morning, and we always do children's stories. And our favorite one is "We Are Made of Stardust." We tell the kids, "We now know, in ways that the Apostle Paul *didn't* know, how God created the atoms of our bodies: the carbon atoms, the calcium in our bones, the iron in our blood!" We show pictures of red giants and supernovas. Kids are, in my experience, fascinated by this.

In fact, five or six years ago, after we had done a program at a church in Georgia, Connie had told not just the children's story but she actually had done a longer religious education program with the elementary-age kids. And the next day, the teacher reported hearing one of the boys on the playground say, "Yeah, even bugs are made of stardust!"

We now have an understanding of how God created the very elements of our bodies. I have found that it's probably the most inherently interesting part of this universe story, this epic of evolution. Kids can visualize it, because you can show pictures from the Hubble or other telescopes. There is also a sense of relatedness—that when you look to the stars, in a very real way, it's like the "Lion King" was right: the stars are our ancestors. They're not our direct ancestors, but stars just like the stars we can see today went through this process, long ago, of creating the various elements that we're now made of. And that is a divine, creative process.

Owen: Hey, I'm taking notes because I'm going to speak to the children in our congregation a few days after people hear this broadcast.

Host: [laughter] I'll tell you the way that Connie does it, because it always gets the entire congregation to laugh. After she talks about our bodies being made of stardust—and we both unhesitatingly talk about that that's the way that God created these atoms—so at one point, towards the end, she'll usually say, "Everything around us—other than the hydrogen atoms, which were created right after 'the Great Radiance' (or what scientists call the Big Bang)—but all the other elements were created inside stars. So, if that's the case, What's your shoe made of?" Invariably, one of the kids will say "stardust." And Connie says, "Right! And what're your clothes made of?" Stardust! "And what did you eat for dinner last night?" Stardust!

And then she'll say, "And what did you poop out this morning?" Stardust!

Of course, everybody busts out laughing at that point. But it's a way of helping young people, especially—and all of us of any age—to feel this incredibly majestic relationship to the night sky that we've only known recently. Of course, that's what your work has specialized in—cosmology and astronomy.

In fact, there's one other story that just came to mind. We were in southwestern Colorado five or six years ago, and Connie did a program with the kids on "We Are Made of Stardust." We came back to that region to do another program, and a woman came up and said to Connie, "I was here last year with my two young kids. My youngest son is now five, and recently I was telling him about something that happened in our family. And he asked,

'Mommy, was I born yet?'" And she said, "I told him no." And he said, "Was I in your belly yet?" Again, no. He said, "Oh, I must have still been stardust!"

Owen: Marvelous!

Host: So because of your expertise in astronomy and the history of science and cosmology, I'm wondering if you could share a little bit on a personal level in terms of, How has an evidential understanding of reality helped you in your own faith walk?

Owen: I am not sure how understanding the antiquity of the universe helps me be a better person. There are certainly ethical issues, which are involved in my Christianity, and I think those have come to us through revelation. By *revelation* I don't necessarily mean thunder and lightning on a mountaintop. How *do* we find out God's will? It is through the mind—through *thoughtful* minds who have been clarifying these things for us through the ages. *That*, I think, is quite important, because when you study Creation and are looking for God, you're apt to find a God of very large numbers—which may not be the kind of God one wants to worship.

It's awesome—that, I grant—as in, "the heavens declare the glory of God." I go along with that. But there has to be something more. And that "something more" has got to come through an understanding of the human relationships. So I would have to say that, for God to establish a human relationship, it has to be done through human persons—and most particularly through Jesus Christ.

Host: So would you say that we learn of the *personal*, and experience the personal, relationship with Ultimacy—with God—in and through the person of Jesus Christ?

Owen: Well, to speak of God as Creator, as an awesome power that can bring the whole universe into being: that can *awe* us with the wonder. But it doesn't bring us to a Christian understanding of the cosmos—not directly. It has to come through our saying, "If God is so enormously powerful, can God put on a personal face to interact with us?" Otherwise, it's hard to have any kind of communication.

And then one asks, "How can the power of God, acting through this human mask—how can He do it?" Then you can start to figure out how it *has* to be done: through prophets, wise people, theologians. This understanding is coming even *today*, through deep thinkers who meditate on these things and ask the deep questions about the meaning of the universe and, looking at the life of Jesus—a suffering, committed kind of life—a totally different kind of kingdom than Caesar or Stalin would like to have. It's an important revelation—and something we have to think very hard about.

Host: I'm glad you used the word *revelation*, because I've found it vital in my own ministry to help people see and value both, what I call, *private revelation* and *public revelation*. *Private*

revelation entails those insights that come to us privately—through dreams, through intuitions. It's as though God is speaking to us personally, individually. But private revelations, because they are subjective experiences that each one of us can have, don't lend themselves to be adopted by millions or billions of people as easily as *public revelation*.

Public revelation is what God is revealing publicly—that is, through the entire human community. And I see science as, in a very real way, expressing or exhibiting God's public revelation. In some ways, science could be seen as humanity's collective intelligence—that today we are more collectively intelligent than we were 500 years ago or 5,000 years ago, or even 50 years ago. In a way, that could be called public revelation: as what God—what Reality—is revealing publicly. That doesn't dismiss or dis or put down private revelation. As you and I know, most things that we now consider to be public revelation first came into being through private revelation. For example, Einstein has a vision of riding a beam of light: that's a private revelation. But then he publishes a paper, and the whole scientific community goes to work trying to disprove it.

The skeptical scientific tradition is all about (it seems to me) trying to discern, "Is this true in a measurable, empirical way?" That is, is it true in a way that all of us can agree—no matter whether we are Buddhists, Christians, atheists, Hindus, or anything else. Whatever our religious or philosophical background, we can agree that this is so. Or, is it merely said to be true, because some charismatic or authoritative person said it—or because it's been passed down through so many generations by tradition that we assume it *must* be true?

Public revelation isn't really *better* than private revelation. But it's almost always more widely useful. More people, and more diverse kinds of people, can agree on something being the case—because of public revelation. I've also found it useful because it really values both the personal, intuitive. But it also lifts up <u>what God's been doing in the last several hundred years</u> through the evidential traditions. (1, 2, 3, 4)

So, I'm wondering, Does that make sense to you? Do you find that distinction useful?

Owen: I think that makes a lot of sense. I haven't thought of it in that particular way, but it resonates with how I would view *revelation*, as well.

Host: I've particularly found it valuable in that it helps to build a bridge between this science-and-religion chasm that is there for some people—and which is often portrayed in the media that way, as polar opposites.

Owen: I would say that the religious movements are extraordinarily powerful and important in our country in holding the social fabric together. I would say that the scientific understanding is another important cultural unity and it's time for both of these important cultural forces to talk to each other.

Host: Amen. I think there's a lot of fertile ground in that process. So in this conversation, I'd love for you to share, Owen, if you would, a little more deeply about your own writing. Share about your book, <u>God's Universe</u>, and anything new that you're working on that you'd love our listeners to know about.

Owen: Well, first of all, *God's Universe* was a collection of three lectures that I gave at Harvard's Memorial Church. Afterwards, I went to Harvard University Press and said, "Might you be interested in these?" And they said, "Oh yes, we're *very* interested." And I said, "How can you be so interested? You haven't read them yet!"

In any event, that book gives a lot of history of science in it, a lot of amateur theological impressions. It talks about everything from the possibility of life on other worlds and what the meaning of that might be, to some of those wonderful questions that can't really be answered —like, why is there something rather than nothing? Or, why is the universe so comprehensible? Wonderful questions like that! A lot of people in the press have liked the book because they tell me they can read it on one airplane trip.

Host: [laughter] I understand in 1999 that you also delivered an Advent sermon at the National Cathedral [in Washington D.C.] Is that material also included in *God's Universe*?

Owen: Parts of it are, of course, because I was speaking about the heavens declaring the glory of God. In fact, I've given two Advent sermons at the National Cathedral. During Advent, they have lay ministers. And so there I was, in a situation that I could hardly have imagined myself to be in when I was a student back in Goshen College.

Host: Well, I must say, as a preacher, that I envy you in that regard. And I don't envy too many things or too many people, but that experience of being able to deliver a sermon during Advent at the National Cathedral would be definitely something that I would hold as a high honor. So I'm thrilled that you've had that opportunity twice.

And again, I thank you for your work—not just within Evangelical circles, but really your work to build a solid bridge between those who value evidence and those who value scripture and tradition. Thank you for helping *all* of us see that it doesn't have to be either-or. Science and scripture can be in a profoundly mutually enriching relationship. And I thank you for your work in writing and your extraordinary teaching over the decades, and also for sharing your ideas, your perspective, and your experience with our listeners here today on the leading edge of faith.

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